

**TUTOR AND STUDENT MANAGEMENT IN LEARNING ASSISTANT OF  
PESMA KH MAS MANSUR BASED ON ANDROID STUDIO**



**This Final Project Compiled as a Condition to Complete Bachelor Degree Program at  
Department of Informatics Faculty of Communication and Informatics**

**Submitted by :**

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**DEPARTMENT OF INFORMATICS  
FACULTY OF COMMUNICATION AND INFORMATICS  
UNIVERSITAS MUHAMMADIYAH SURAKARTA**

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**APPROVAL PAGE**

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**SCIENTIFIC PUBLICATION**

By:

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ACCPTANCE PAGE

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Accepted by the board Examiner  
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On Tuesday, Agust 6, 2019

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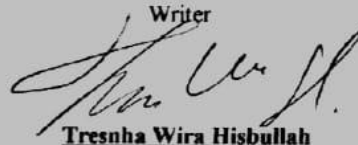
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KH Mas Mansur Based on Android Studio App**  
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**TUTOR AND STUDENT MANAGEMENT IN LEARNING ASSISTANT OF PESMA KH  
MAS MANSUR BASED ON ANDROID STUDIO**

**Abstract**

Tutor attendance and performance are directly related to student outcomes, the more tutors are absent, the more their student's achievement suffers. In this case there are some problem that happening in PESMA KH Mas Mansur. The main problem is, all of morning class activity is still using a paper like make the tutor and student attendance. Whereas the amount of student and tutor is very much. Sometimes, when the data is missing means the paper is missing, they must make it from beginning. The purpose of this project is to minimize the paper use during the morning class activity and to increase the admin control of all tutors and students in morning class and the last is to give a temporary student evaluation before final evaluation, so the students will know what things they have to improve and keep, and it will give them change to fix their weakness before the examination test of PESMA KH Mas Mansur. In this case, the waterfall method is the precise method for developing the project and the programming application is using Android Studio. And for the test, this project was tested by black box testing and user acceptance satisfactory. And the result of the test is around 70% of all tester in PESMA KH Mas Mansur satisfied using this application and they give positive response to this application.

**Keywords:** Data Management, Morning Learning Class, Learning Assistant

**Abstrak**

Kehadiran dan kemampuan tutor sangat berhubungan dengan hasil atau evaluasi dari mahasiswa PESMA KH Mas Mansur. Semakin banyak tutor yang tidak menghadiri kelas, semakin rendah hasil evaluasi dari mahasiswa. Dalam kasus ini, ada beberapa masalah

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# **TUTOR AND STUDENT MANAGEMENT IN LEARNING ASSISTANT OF PESMA KH MAS MANSUR BASED ON ANDROID STUDIO**

## **Abstract**

Tutor attendance and performance are directly related to student outcomes, the more tutors are absent, the more their student's achievement suffers. In this case there are some problem that happening in PESMA KH Mas Mansur. The main problem is, all of morning class activity is still using a paper like make the tutor and student attendance. Whereas the amount of student and tutor is very much. Sometimes, when the data is missing means the paper is missing, they must make it from beginning. The purpose of this project is to minimize the paper use during the morning class activity and to increase the admin control of all tutors and students in morning class and the last is to give a temporary student evaluation before final evaluation, so the students will know what things they have to improve and keep, and it will give them change to fix their weakness before the examination test of PESMA KH Mas Mansur. In this case, the waterfall method is the precise method for developing the project and the programming application is using Android Studio. And for the test, this project was tested by black box testing and user acceptance satisfactory. And the result of the test is around 70% of all tester in PESMA KH Mas Mansur satisfied using this application and they give positive response to this application.

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## **Abstrak**

Kehadiran dan kemampuan tutor sangat berhubungan dengan hasil atau evaluasi dari mahasiswa PESMA KH Mas Mansur. Semakin banyak tutor yang tidak menghadiri kelas, semakin rendah hasil evaluasi dari mahasiswa. Dalam kasus ini, ada beberapa masalah yang terjadi pada kinerja kelas pagi di dalam PESMA KH Mas Mansur. Masalah utamanya ialah semua kegiatan terutama kegiatan kelas pagi masih menggunakan kertas, sehingga manajemen data asih sangat rentan. Terkadang ketika kertas – kertas tersebut hilang, maka para staff PESMA harus membuat ulang kembali dari awal. Jadi tujuan dari pembuatan aplikasi ini ialah terutama *meminimalisasi* penggunaan kertas selama kelas pagi berlangsung. Dan tujuan lain ialah membantu mengatasi permasalahan – permasalahan yang terdapat pada semua tutor dan mahasiswa. Adapun Metode yang digunakan ialah *waterfall* karena lebih *simple* dan pas untuk kasus ini. Dan aplikasi yang digunakan ialah *Android Studio*. Untuk pengetesan menggunakan dua Metode yaitu Metode *black box* dan Metode Kepuasan dari pengguna (Kuisisioner). Adapun hasil dari pengujian aplikasi menunjukkan berkisar 70% dari semua penguji merasa puas dengan aplikasi yang digunakan bahkan setuju untuk bisa di aplikasikan di PESMA KH Mas Mansur dengan memerlukan beberapa pengembangan lebih lanjut.

**Kata Kunci: Management Data, Pembelajaran Kelas Pagi, Asisten Pembelajaran**

## **1. PREMILINARY**

Tutor attendance and performance are directly related to student outcomes, the more tutors are absent, the more their student's achievement suffers. The quality of teaching determines the standard of education in an institution, investing in a system that keeps effective tutors in the classroom should be a priority for school leaders and policymakers (Sarker, Hossain & Jamil, 2016). The problem statement is that to manage all tutors and students in PESMA KH Mas Mansur is still using a conventional process, or almost all report of all tutors and students are use a paper which is in this era, everything is become sophisticated. The management method of tutors and students like attendance report, student evaluation in International Boarding School Pesma KH Mas Mansur are still need improvements, especially during morning class like attendance report, evaluation report, and the other reports. The conventional attendance method is also cumbersome when the mark amount is large (Mendonca, D'mello & D'souza, 2015).

An assistant in teaching is required to improve management especially teacher and student or tutor and student. Academic administrative problem also occurs when an institution does not have a representative school administrative website or system (Supriyono, et al, 2016; Kurniawan, 2018). A teaching assistant here is not like artificial intelligence. It cannot make decision. The teaching assistant here can help tutor during morning class teaching activity, start from fill the student attendance, showing the teaching lesson schedule, fill the student evaluation, fill the tutor's journal, until tutor's attendance. The point is a learning assistant or a teaching assistant program will minimize all tutors from using paper during teaching class activity.

International Boarding School Pesma KH Mas Mansyur (Pesma) is one of the central Muhammadiyah regeneration institution. As the institution and unit of Universitas Muhammadiyah Surakarta (UMS), Pesma accommodates 576 students in total and chooses 48 tutors in the field of English language and Qur'an for each semester. Tutors in Pesma originated from students who has endured tests, sessions and has been choose by Pesma to teach the other students after morning prayers. The rest of them who not become a tutor are student. Students usually joining the morning class and evening class and all examination in Pesma, that all the morning class activity still use manual pretention like shown in figure 1. There are not journal of tutor during morning class teaching activity where it is also necessary for staff to monitor tutor performance in teaching students in morning class agenda.



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Mudabbir : Tresnha Wira Hisbullah  
Subject : English

Room	Name	NIM	Student Attendance Checklist																			
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Figure 1. Manual Form

## 2. METHOD

This app is made with the waterfall model like shown in figure 2, which consists of system requirements, software requirements, analysis, program design, coding, testing, and operations (Royce, 1970). This learning assistant require android smartphone for the user and the server. All of activity of teaching class will be running in smartphone. Software required in the development of this application are Windows Operating System, Android Studio (android programming), Firebase Database (android database), Corel Draw for designing the UI app.

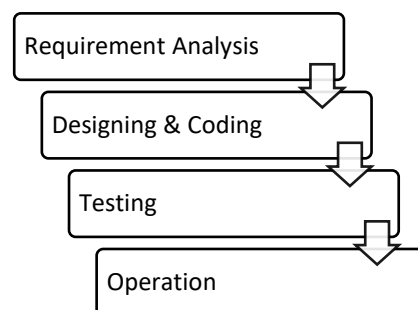


Figure 2. Waterfall Model

Based on the interview with the Pesma Elder Member, Mr. Mujazin and analysis the system of morning class activity, the application requires six main functions which are create or delete tutor account, keeping track of tutor's attendance, keeping track of student's attendance, showing schedule of lesson that will teach by tutor, student's evaluation and tutor's journal form. Adding the

current tutor on the app is made by creating the new username and password in admin page, then when the user login in the tutor page, the user just use username and password that already created by admin. Admin can delete the current tutor who already registered by delete current account directly in firebase console.

Keeping track of tutor's and student's attendance can done by scanning their QR Code using smartphone. The QR Code scanner is replaced by admin and tutor's phone camera. Tutors scan their QR Code to admin's phone camera and students scan their QR Code to tutor's phone camera to indicate that they are attending the class and the data will be saved in online database. Using firebase database and able to share to all account like admin, tutor, and student account. The main feature of firebase can synchronize the data automatically without make an update request or refresh application (Wiratno & Astuti, 2017). The data about tutor's attendance can recall in admin page especially in Tutor Attendance Report. The data about student's attendance can recall in evaluation report in admin, tutor, and student page. The details of the user interaction are show in figure 3.

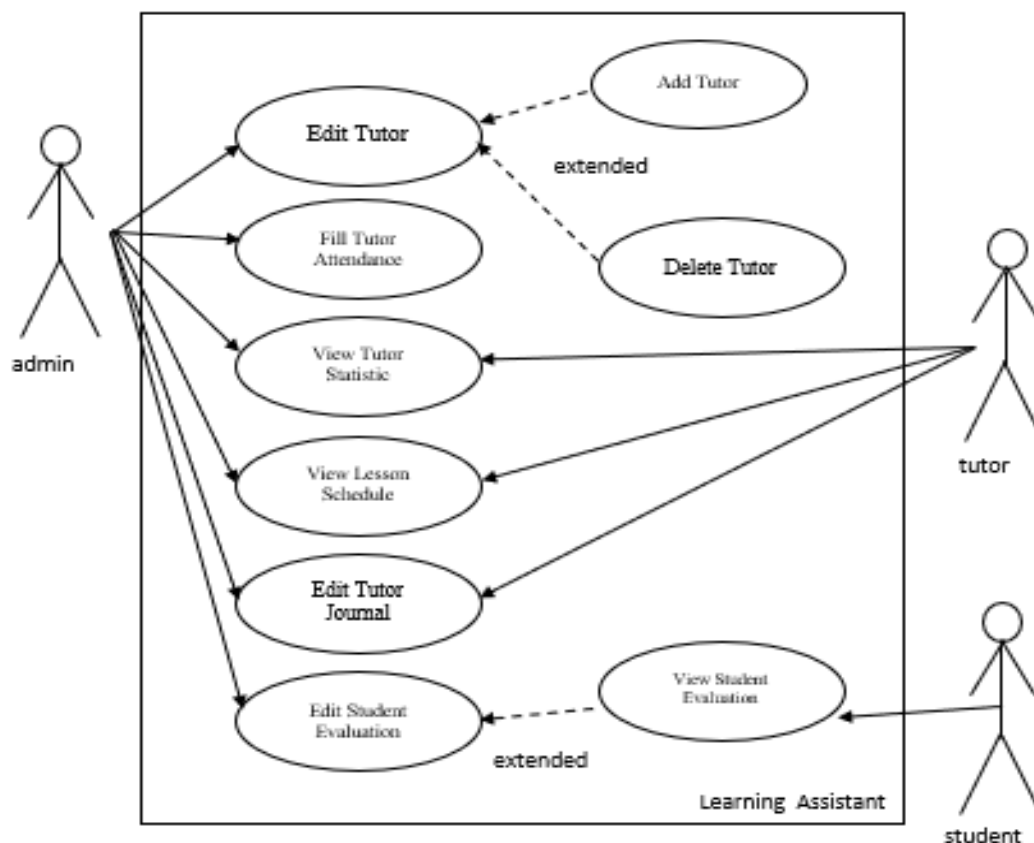


Figure 3. Use case diagram of the app

Showing schedule of lesson that will teach by tutor can guide all tutor when they teach in morning class activity. All tutor will teach the same lesson for each groups every meeting. There are thirty-six groups of students during morning class activity, it means that each tutor handles one or two groups of students. After teaching, there are student evaluation form and tutor's journal form, tutor fills both. Admin can view the result and can edit the form, whereas students just only view their student evaluation form which already fill by tutor. The explanation about how the data will inputted, stored, and shared from one account to another account is show in figure 4.

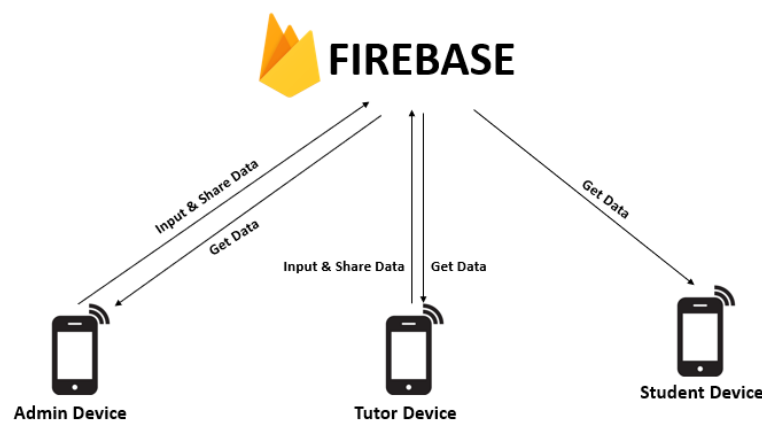


Figure 4. Firebase work concept

All data for tutors and students account will stored in Firebase database like tutor and student attendance report, student evaluation report and tutor journal report. However, all user that using the application must input the data first, like tutor make a student's attendance with scan their QR Code. Quick Response (QR) codes are two dimensional (matrix) codes that have been developed in ways that allow companies and individuals to sell or market their products, skills, and events quickly and easily (Petrova, K., Romanello, A., Medlin, B. D., & Vannoy, S. A, 2016). Then after scan the QR Code, they submit the data and the data is stored. Then, when admin wants to view the student's attendance report, admin can access the data through firebase database.

### 3. RESULT AND DISSCUSSION

This application is program using Android studio application and using Java programming language. Android Studio is an official integrated development tool or environment for Google's Android operating system build on JetBrains' IntelliJ IDEA software (Verma, N., Kansal, S., & Malvi, H. 2018). The algorithm of this application like the menus, login function, online database function, some design of this application made by android studio application. the display of android studio application is show in figure 5.

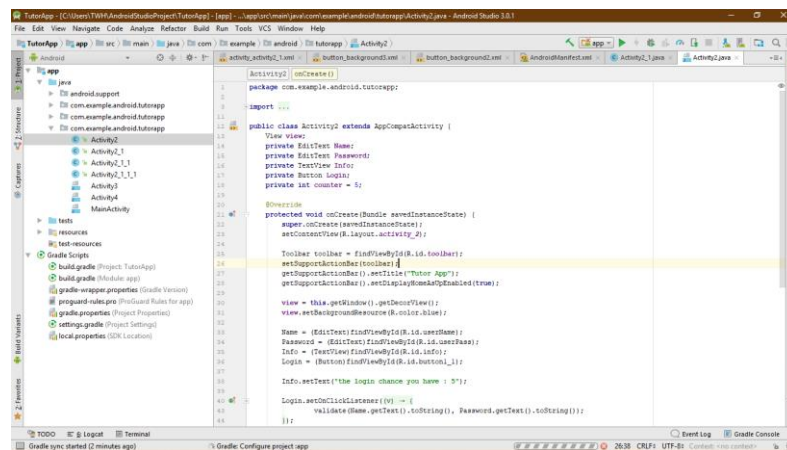


Figure 5. Android Studio application display

There are three different users who can access this application, first is admin, the second is tutor then the student. each of them have different access rights. admin user has access rights more than tutor, but tutor has access rights more than student. admin user can do what tutor user do because admin user should monitoring all tutor and student progress. The example display with all menus in admin's page is shown in figure 6.

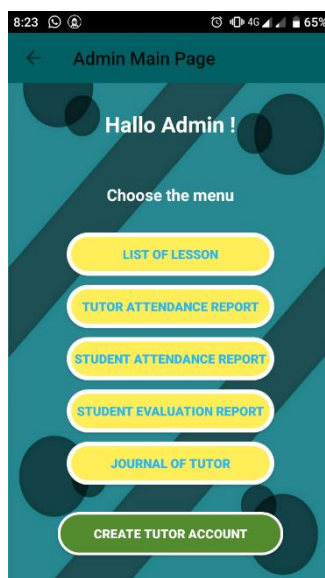


Figure 6. The display of admin's menu in Learning Assistant App

In admin user page, it has completed features start from displaying the lesson schedule, make a report, make an evaluation and other activities which all features are also include in tutor and student account. Admin user has all features from tutor and student user because admin is the highest user of all user in this application, the special feature that admin user has is “Create Tutor Account” function. With this feature, admin user can make new tutor account with input the new tutor email and password, then the new tutor account will be created, then each tutor can login with their email and password that already created by admin user. The User Interface of tutor user will show in figure 7.

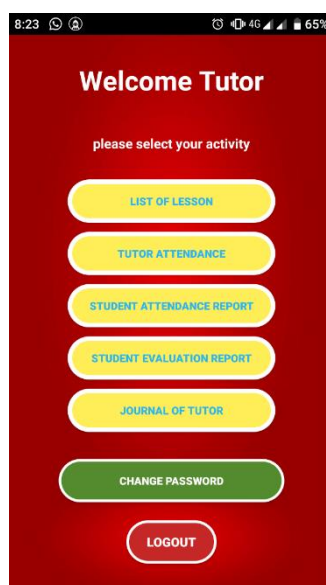


Figure 7. The display of tutor’s menu in Learning Assistant App

In tutor page, there are all features that tutor need during morning class, start from show the lesson schedule that will tutor teach to student, attendance system, evaluation system, and the last is make a journal which can record about what lesson that has been teach by tutor for every meeting. Tutor user also has a special feature when the admin user already create the tutor account. The tutor itself can change their password, so the new must be easier to remember by each of them. The login system in tutor is to determine which one is tutor and which one is just a student. Different with tutor user, student user not need to login while they want to access the student page. The display of student page will shown in figure 8.



Figure 8. The display of student's menu in Learning Assistant App

In student page, the feature is not much as tutor and admin user. Student user just can know what will tutor teach in morning class, so they can prepare before that. Student user also can make their attendance just like all student normally, and also can see their evaluation result. Their can access another evaluation result because this evaluation in this app is not the final evaluation. The evaluation here is just like tutor's opinion to student not privately. The student also can learn from the others. After design and coding the application, to minimize error, function test was conducted by expert informatics learner. Software testing is necessary to make sure that software or application which in develop or already build able to execute based on the main functionality (Mustaqbal, Firdaus & Rahmadi, 2015). the result is shown on the tables below.

Table 1. Blackbox Testing Result of Admin Page

No	Case	Test Scenario	Output	Result
1.	Login Test	Input username and password, then click login button	System shows dashboard of admin page	Valid
2.	View the Lesson Schedule	Access the lesson schedule menu, then click one of both subject type	System show all schedule for both type of lesson	Valid
3.	Execute the Tutor Attendance	Access to Tutor Attendance menu, then make a new attendance, and finally input the tutor data using scan the tutor QR Code and submit it.	The data of current tutor who already scann is stored to firebase database	Valid
4.	View the Tutor Attendance Report	Access the Report of Tutor Attendance in Tutor Attendance Menu	System show all data of tutor who already scann	Valid
5.	Search the current Tutor	Searching the name of tutor in all Tutor Attendance Report	System show current data of tutor based on the search	Valid
6.	View the Student Attendance Report	Access the Report of Student Attendance in Student Attendance Menu	System show all data of students who already scann	Valid



Table 1. Blackbox Testing Result of Admin Page

No	Case	Test Scenario	Output	Result
7.	Search the current student	Searching the name of student in all Student Attendance Report	System show current data of student based on the search	Valid
8.	View the Student Evaluation Report	Access the Report of Student Evaluation in Student Evaluation	System show all data of students evaluation report	Valid
9.	Search the current student	Searching the name of student in all Student Evaluation Report	System show current data of student based on the search	Valid
10.	View one data of student evaluation report	Access the one of all report of student evaluation data	The data of one student which clicked is show in detail	Valid
11.	View the Tutor Journal Report	Access the Report of Tutor Journal in Journal of Tutor	System show all data of tuotr journal report	Valid
12.	Search the current tutor	Searching the name of tutor in all Tutor Journal Report	System show current data of tutor based on the search	Valid
13.	View one data of tutor journal report	Access the one of all report of tutor journal data	The data of one tutor which clicked is show in detail	Valid
14.	Create Tutor Account	Input the valid tutor email and the password based on admin want, then register it	The data will stored in firebase database and it will used by one current tutor who login in tutor login	Valid

Blackbox testing focused on the functionality specification from the software, which tester is able to determine all input condition and testing the program functionality specification (Mustaqbal, Firdaus & Rahmadi, 2015). The analogous like when we view the black box, we only able to see from the outside but we not need to know inside (Astuti, 2018). In this application, the test is using Black Box testing start from testing the admin features, tutor features and student features. The tester will check all features in this application one by one, start from open the app until the app closed. In table above (table 1) show the result of black box testing in the admin page. The result of black box testing of tutor and student page is on the table below.

Table 2. Blackbox Testing Result of Tutor Page

No	Case	Test Scenario	Output	Result
1.	Login Test	Input username and password, then click login button	System shows dashboard of tutor page	Valid
2.	Make new Attendance	Access the Tutor Attendance then input the tutor name to generate the QR Code	System show the QR Code result based on the input name	Valid
3.	View the Lesson Schedule	Access the lesson schedule menu, then click one of both subject type	System show all schedule for both type of lesson	Valid
4.	Execute the Student Attendance	Access to Student Attendance menu, then make a new attendance, and finally input the student data using scan the tutor QR Code and submit it.	The data of current student who already scann is stored to firebase database	Valid

Table 2. Blackbox Testing Result of Tutor Page

No	Case	Test Scenario	Output	Result
5.	View the Student Attendance Report	Access the Report of Student Attendance in Student Attendance Menu	System show all data of student who already scann	Valid
6.	Search the current Student	Searching the name of student in all Student Attendance Report	System show current data of student based on the search	Valid
7.	Make Student Evaluation	Access the Student Evaluation menu, then click on make an evaluation, after that fill the form and finally the data is submit	The data about current student evaluation is stored on firebase database	Valid
9.	View the Student Evaluation Report	Access the Report of Student Evaluation in Student Evaluation	System show all data of students ealuation report	Valid
10.	Search the current student	Searching the name of student in all Student Evaluation Report	System show current data of student based on the search	Valid
11.	View one data of student evaluation report	Access the one of all report of student evaluation data	The data of one student which clicked is show in detail	Valid
12.	Make Tutor Journal	Access the Tutor Journal menu, then click on make a journal, after that fill the form and finally the data is submit	The data about current tutor jorual is stored on firebase database	Valid
13.	View the Tutor Journal Report	Access the Report of Tutor Journal in Journal of Tutor	System show all data of tuotr journal report	Valid
14.	Search the current tutor	Searching the name of tutor in all Tutor Journal Report	System show current data of tutor based on the search	Valid
15.	View one data of tutor journal report	Access the one of all report of tutor journal data	The data of one tutor which clicked is show in detail	Valid
16.	Change Tutor Password	Input the valid tutor email and submit it, then the notification to change the password will sent to the current input email, and finally change the password then save it	The new password will replace the old password of the current tutor, and tutor can login with new password	Valid

Table 3. Blackbox Testing Result of Student Page

No	Case	Test Scenario	Output	Result
1.	View the Lesson Schedule	Access the lesson schedule menu, then click one of both subject type	System show all schedule for both type of lesson	Valid
2.	Make new Attendance	Access the Student Attendance then input the student name to generate the QR Code	System show the QR Code result based on the input name	Valid
3.	View the Student Evaluation Report	Access the Report of Student Evaluation in Student Evaluation	System show all data of students ealuation report	Valid
4.	Search the current student	Searching the name of student in all Student Evaluation Report	System show current data of student based on the search	Valid

Table 3. Blackbox Testing Result of Student Page

No	Case	Test Scenario	Output	Result
5.	View one data of student evaluation report	Access the one of all report of student evaluation data	The data of one student which clicked is show in detail	Valid

Beside testing using blackbox method, this program was tested by PESMA member's representative, consist of PESMA staff as an admin, several tutors and several students. Once they tried the system, questionnaires are given to know how the user acceptance toward the system. The questionnaire represents performance, interface designs, information representation, and functionability. Each question is given a value with maximum five points. The table below shows the satisfaction result:

Table 4. Users Acceptance Satisfactory for Admin

Respondent	Question							
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Respondent 1	4	3	5	4	5	4	3	4
Respondent 2	4	4	4	4	4	5	5	5
Respondent 3	4	4	5	4	5	4	4	5
Respondent 4	4	3	5	4	5	4	3	4
Respondent 5	4	4	5	4	5	4	4	5
Respondent 6	4	4	4	4	4	5	5	4
Total	24/30	22/30	28/30	24/30	28/30	26/30	24/30	27/30

Code refer to:

- Q1 : Is the application having clear display and attractive?
- Q2 : Is the application being easy to use?
- Q3 : Are the all buttons in this application functional?
- Q4 : Are the all system in this application fully operated?
- Q5 : Are all data (attendance, evaluation, journal) in the output system is same with the input?
- Q6 : Are all data in the firebase database make easy enough to monitoring all activity from tutors and students?
- Q7 : Are the data in firebase database easy to get by each of users based on their right access?
- Q8 : Is the application able to improve admin to monitoring all activity of tutors and students every morning class activity? **(For Admin)**

Table 5. Users Acceptance Satisfactory for Tutor and Student

Respondent	Question							
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Respondent 1	4	4	4	4	5	4	4	5
Respondent 2	5	5	5	5	5	5	5	5
Respondent 3	3	4	4	4	3	4	4	4
Respondent 4	4	5	5	5	5	5	5	5
Respondent 5	4	4	5	5	5	5	5	4
Respondent 6	5	5	5	5	4	4	5	4
Respondent 7	4	4	4	5	5	3	4	4
Respondent 8	5	5	5	5	5	5	5	4
Respondent 9	4	4	5	5	5	5	5	4
Respondent 10	4	5	5	5	5	4	4	4
Respondent 11	3	4	4	4	3	4	4	4
Respondent 12	4	4	5	5	5	5	5	4
Respondent 13	4	4	4	5	5	3	4	4
Respondent 14	4	4	5	5	5	5	5	4
Respondent 15	4	4	4	5	5	3	4	4
Respondent 16	4	5	5	5	5	5	5	5
Respondent 17	3	4	4	4	3	4	4	4
Respondent 18	5	5	5	5	5	5	5	5
Respondent 19	4	4	4	4	5	4	4	5
Respondent 20	4	5	5	5	5	5	5	5
Respondent 21	4	4	5	5	5	5	5	4
Respondent 22	5	5	5	5	5	5	5	4
Total	90/110	97/110	98/110	105/110	103/110	97/110	101/110	95/110

Code refer to:

- Q1 : Is the application having clear display and attractive?
- Q2 : Is the application being easy to use?
- Q3 : Are the all buttons in this application functional?
- Q4 : Are the all system in this application fully operated?
- Q5 : Are all data (attendance, evaluation, journal) in the output system is same with the input?
- Q6 : Are all data in the firebase database make easy enough to monitoring all activity from tutors and students?
- Q7 : Are the data in firebase database easy to get by each of users based on their right access?
- Q8 : Is the application can become a good assistant for all tutors and students during morning teaching class?

**(For Tutor and Student)**

User acceptance test shows the result of the system which the users are satisfied with the end result since the final score is 203 out of 240 of Admin result or around eighty-four percent satisfactory and 786 out of 880 of Tutor and Student result or around eighty-nine percent satisfactory. Once the test has been conducted, maintenance is conducted to make sure that the system runs perfectly by doing regular checking and working on user feedbacks if bug occurs.

All data from firebase can recall in the application, like all data about attendance report, evaluation report and also journal report. Admin user can know all data that have stored by tutor and student. The display about attendance report from admin page will show in figure 9.

Tutor Attendance Report	
Text the Name Here	
Jul 30, 2019	Dyah Nurul Azizah
Jul 30, 2019	Anisa Kurnia Rahma
Jul 31, 2019	Assyati Atmadja
Jul 31, 2019	Febiana Nur Ramdani
Jul 31, 2019	Aldocaesar N.Z.S
Jul 31, 2019	Tresnha Wira Hisbullah
Jul 31, 2019	Dyah Nurul Azizah
Jul 31, 2019	Anisa Kurnia Rahma
Jul 31, 2019	Aldocaesar N.Z.S

Figure 9. The display of Tutor Attendance Report in Admin User Page

In figures above, the report show all tutor who come to morning class based on the calender. In this case, the system of attendance report model is to get the information about how much a tutor or a student who joining the class in a semester. The admin can know it by search one of all tutor or student name in a report and can count how much that name is appear. An admin also can know the detail information about the tutor journal report after one of the list is clicked, for example the date, type of lesson, name of lesson, name of tutor, amount the student who join the class and lesson description, and it is also happening in evaluation report. However in evaluation report, not only admin user who can get the information but student also able to get the same information. This evaluation report here is not a final report like “Yudissium” in PESMA KH Mas Mansur, this evaluation report here means, how tutor give motivation to each student so the student will get motivation to increase their skill or keep what they already reach. In student user page, all student can view each other student evaluation because this evaluation report is different with a report in a school or university.

#### **4. CONCLUSION**

Based on result and discussion of this final project, there are conclusions that can be taken as follow: Learning Assistant application can become an assistant for tutor and student during morning class activity, start from make an attendance of tutor or student, until fill the journal form every after morning class. Admin user can know all report that have been stored by tutor user, start from report about student attendance, until report about tutor journal. The admin only needs to access the firebase database to get all report information. Using this application, all components like admins, tutors and students can avoid to use a paper because when we still use a paper, the data need to manage more carefully especially when the data is very much. If one paper is missing, the admin or tutor not have a backup and need to start from beginning to make a new data.

Based on the result of black box testing and user acceptance testing. In user acceptance testing result, the users are satisfied with the result since the final score is 203 out of 240 of Admin result or around eighty-four percent satisfactory and 786 out of 880 of Tutor and Student result or around eighty-nine percent satisfactory. The total of all result is around eighty-six percent of all PESMA member are satisfied with this application. In black box testing, every activity in this application are working functional. Even there are several things need improvement in this application.

This final project leaves rooms for improvement, there are further possible development for the future such as: how to send the data especially the data about tutor or student attendance report using broadcast message directly to firebase database. All tutor does not need to find admin or all student do not need to find tutor to make new attendance. Another improvement is how the QR Code is automatically added when the tutor must make new attendance to admin without the tutor need to input their name every time, they want to get scanned. The last improvement is how to store a name in a database just once, so when tutor want to input some letter or keyword of the student name in making a student evaluation report, the full name is automatically appeared.



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